625-EMD-101

EOSDIS Maintenance and Development Project

Training Material for the EMD Project
Volume 1: Course Outline

Revision --

July 2007

Raytheon Company
Upper Marlboro, Maryland

Training Material for the EMD Project
Volume 1: Course Outline

Revision --

July 2007

Prepared Under Contract NAS5-03098
CDRL Item 23

RESPONSIBLE ENGINEER

Kenneth Prickett 7/30/07
Kenneth Prickett Date
EOSDIS Maintenance and Development Project

RESPONSIBLE OFFICE

Mary S Armstrong 7/31/2007
Mary Armstrong, Program Manager Date
EOSDIS Maintenance and Development Project

Raytheon Company
Upper Marlboro, Maryland

This page intentionally left blank.

Preface

This document is a formal contract deliverable. It requires Government review and approval within 45 business days. Changes to this document will be made by document change notice (DCN) or by complete revision.

Any questions should be addressed to:

Data Management Office
The EMD Project Office
Raytheon Company
1616 McCormick Drive
Upper Marlboro, Maryland 20774-5301

Revision History

Document Number	Status/Issue	Publication Date	CCR Number
625-EMD-101	Original	July 2007	07-0381

This page intentionally left blank.

Abstract

Volume 1 of the training material for the Earth Observing System Data and Information System (EOSDIS) Maintenance and Development (EMD) Project is the Training Course Outline. The course outline lists a series of sub-tasks that will be used to define a comprehensive course of instruction for the EMD Project. The training addressed in this outline is related to the specific system design, components and operation of the current baseline of the system and does not include training on management or personal development.

***Keywords**:* training, instructional design, course objective.

This page intentionally left blank.

Contents

Training Schedule

Abbreviations and Acronyms

Introduction

Identification

Training Material Volume 1 is part of Contract Data Requirements List (CDRL) Item 23, which is a required deliverable under the Earth Observing System Data and Information System (EOSDIS) Maintenance and Development (EMD) Contract (NAS5-03098).

Scope

Training Material Volume 1 (Course Outline) provides an overview of available courses developed to support operator training for the EOSDIS Core System (ECS). Each lesson contains a list of tasks (grouped together by subject) required to operate the system. The tasks serve as the foundation of the operator training course and define expectations for each lesson.

Purpose

The course outline highlights the learning path for curriculum development as well as course conduct. Lesson objectives are formed using the tasks listed in the course outline. The objectives serve as the basis for Student Guide and slide presentation material development and course conduct.

Status and Schedule

This document provides an outline of training for the current baseline of the system. Revisions are submitted as needed.

Organization

This document is organized as follows:

Introduction:	The Introduction presents the document identification, scope, purpose, and organization.
Related Documentation:	Related Documentation identifies parent, applicable and information documents associated with this document.
Course Outline:	The Course Outline section identifies and defines the lesson topics, duration, and scope of the course.

This page intentionally left blank.

Related Documentation

Parent Documents

The parent documents are the documents from which the EMD Training Material's scope and content are derived.

423-41-01	Goddard Space Flight Center, EOSDIS Core System (ECS) Statement of Work
423-46-03	EMD Task 101 Statement of Work For ECS SDPS Maintenance
423-46-02	Contract Data Requirements Document for EMD Task 101 ECS SDPS Maintenance

Applicable Documents

The following documents are referenced within this EMD Training Material, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this document:

420-05-03	Goddard Space Flight Center, Earth Observing System (EOS) Performance Assurance Requirements for the EOSDIS Core System (ECS)
423-41-02	Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) (ECS F&PRS)
423-46-01	Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) Science Data Processing System (EMD F&PRS)

Information Documents

Information Documents Referenced

The following documents are referenced herein and amplify or clarify the information presented in this document. These documents are not binding on the content of the EMD Training Material.

609-EMD-100	Release 7.20 Operations Tools Manual for the EMD Project
611-EMD-100	Release 7.20 Mission Operation Procedures for the EMD Project

Information Documents Not Referenced

The following documents, although not referenced herein and/or not directly applicable, do amplify or clarify the information presented in this document. These documents are not binding on the content of the EMD Training Material.

305-EMD-100	Release 7.20 Segment/Design Specification for the EMD Project
311-EMD-100	Rel 7.20 INGEST (INS) Database Design and Schema Specifications for the EMD Project
311-EMD-101	Release 7.20 Science Data Server Database Design and Schema Specifications for the EMD Project
311-EMD-102	Release 7.20 Storage Management Subsystems Database Design and Database Schema Specifications for the EMD Project
311-EMD-103	Release 7.20 Systems Management Subsystem Database Design and Schema Specifications for the EMD Project
311-EMD-104	Release 7.20 Order Manager Database Design and Database Schema Specifications for the EMD Project
311-EMD-105	Release 7.20 Spatial Subscription Server (SSS) Database Design and Schema Specifications for the EMD Project
311-EMD-106	Release 7.20 Data Pool Database Design and Schema Specifications for the EMD Project

Course Outline

The Operator Training Course is grouped into modular lessons based on common task groupings and operational requirements. Each lesson outline will contain a lesson description, a list of recommended class attendees (by position), Commercial Off-the-Shelf (COTS) hardware (HW) and software (SW) requirements, duration (lab and lecture) and a list of sub-tasks required to satisfy the overall lesson objective using tools described in Document 609-EMD-100 (*Release* 7.20 *Operations Tools Manual for the EMD Project*) and procedures described in Document 611-EMD-100 (*Release* 7.20 *Mission Operation Procedures for the EMD Project*). The course consists of the lessons that follow.

Volume 2: Introduction and Detailed System Overview; Science Data Processing Internal Training - Retired

Volume 3: Problem Management

Volume 3 provides a detailed description of the different tasks that are required in order to report a problem. The lesson includes a detailed review of the trouble ticket process.

Attendees: All DAAC Operator and Support personnel, all SMC Operator and Support personnel, all Sustaining Engineering personnel, all ILS personnel, all Investigator support personnel and all IV & V contractor personnel.

Prerequisites: None

Duration: 2 Hours (1 Lecture, 1 Lab)

Sub-tasks:

1. Writing a trouble ticket.
    a. Writing/submitting trouble tickets.
2. Documenting changes.
    a. Reviewing and modifying trouble tickets.
3. Problem management.
    a. Control board reviews.
    b. Assessing/categorizing problem severity.

Practical Exercises: The student will perform the following hands-on training exercises:

1. Students will write a trouble ticket.
2. Students will document trouble ticket changes.

3. Students will evaluate trouble tickets and critique the description and assignment of severity.

Volume 4: System Administration - Retired

Volume 5: Network Administration - Retired

Volume 6: Production Planning and Processing - Retired

Volume 7: Resource Planning - Retired

Volume 8: Ingest

Volume 8 provides a detailed description of the process for receiving ingesting data from external data providers. It includes methods for monitoring the performance of ingest requests, and modifying ingest parameters.

Attendees: DAAC Archive Manager, DAAC Ingest Technician, DAAC System Engineer, DAAC System Test Engineer, DAAC User Services Representative and Sustaining Engineering personnel.

Prerequisites: None

Duration: 8 Hours (4 Lecture, 4 Lab)

Sub-tasks:

1. Ingest concepts.
2. Logging in to system hosts.
3. Launching the ECS Data Pool Ingest GUI and Data Pool Maintenance GUI.
4. Monitor and control SIPS ingest requests.
5. View history of Ingest Requests.
6. Monitor and control Provider Status.
7. Monitor and control File System Status.
8. Monitor and control Transfer Status.
9. Monitor and control ECS Service Status.
10. Review Ingest Requests with Open Interventions.
11. Review Alerts.
12. Configure a Data Provider.
13. Configure a Data Type.
14. Configure a Transfer Host.
15. Configure a File System.
16. Configure an ECS Service.

17. Perform Global Tuning.
18. Configure a Volume Group.
19. Generate Ingest Reports.

Practical Exercises: The student will perform the following hands-on training exercises:

1. Logging in to system hosts.
2. Launching the ECS Data Pool Ingest GUI and Data Pool Maintenance GUI.
3. Monitor and control SIPS ingest requests.
4. View history of Ingest Requests.
5. Monitor and control Provider Status.
6. Monitor and control File System Status.
7. Monitor and control Transfer Status.
8. Monitor and control ECS Service Status.
9. Review Ingest Requests with Open Interventions.
10. Review Alerts.
11. Configure a Data Provider.
12. Configure a Data Type.
13. Configure a Transfer Host.
14. Configure a File System.
15. Configure an ECS Service.
16. Perform Global Tuning.
17. Configure a Volume Group.
18. Generate Ingest Reports.

Volume 9: Data Distribution

Volume 9 provides information to support the operators in distributing science data using various media. This lesson provides a complete process by which the Distributed Active Archive Center (DAAC) personnel perform data distribution, including order management using the Order Manager (OM) graphical user interface (GUI). The processes described in the lesson apply to Distribution Techniciansand includes such tasks as monitoring data distribution requests; changing the priority of a distribution request; canceling, suspending and/or resuming a distribution request; unloading/loading tape stackers. The procedures involved in OM GUI operation include such tasks as launching the OM GUI, responding to an open intervention, viewing distribution request information, viewing a completed intervention, and checking OM queue status.

Attendees: DAAC Archive Manager, DAAC Distribution Technician, DAAC System Engineer, DAAC System Test Engineer, DAAC SW Maintenance Engineer, DAAC User Services Representative and Sustaining Engineering personnel.

Prerequisites: None.

Duration: 8 Hours (4 Lecture, 4 Lab)

Sub-tasks:

1. Distribution concepts.
2. Logging in to system hosts.
3. Launching the Data Distribution and Order Manager GUIs.
4. Monitoring/controlling distribution requests.
5. Modifying e-mail preambles.
6. Respond to distribution open interventions
7. Monitoring/controlling Order Manager operations (including physical media distribution).
8. Change priority of a distribution request.
9. Suspend/Resume a distribution request.
10. Edit ftp/scp push parameters.
11. View HEG interventions.
12. Respond to HEG distribution open interventions.
13. View pending HEG granules.
14. View Operator Alerts
15. Modify OM queue status.
16. Modify HEG Order status.
17. Check Staging status.
18. Add a destination to frequently used destination list.
19. View the OM GUI Log.
20. View PMD open intervention information.
21. Respond to a PMD open intervention.
22. Check and modify PMD configuration
23. Using the Order Manager Command Line Utility.
24. Using the OMS configuration script (OMS Configuration CI).

25. Tuning Data Server Subsystem parameters.

Practical Exercises: The student will perform the following hands-on training exercises:

1. Students will log in to system hosts.
2. Students will launch the data distribution operator and Order Manager GUIs.
3. Students will monitor/control data distribution requests.
4. Students will modify e-mail preambles.
5. Students will configure storage management polling.
6. Students will delete files from cache.
7. Students will launch the OM GUI.
8. Students will view open intervention information on the OM GUI.
9. Students will respond to an open intervention.
10. Students will monitor/control distribution request information on the OM GUI.
11. Students will change the priority of a distribution request using the OM GUI.
12. Students will suspend, resume, cancel, or resubmit a distribution request using the OM GUI.
13. Students will edit ftp scp push parameters.
14. Students will view open HDF-EOS to GeoTIFF Conversion Tool (HEG) request intervention information on the OM GUI.
15. Students will respond to an open HEG intervention.
16. Students will view pending HEG granules on the OM GUI.
17. Students will view operator alerts on the OM GUI.
18. Students will view a completed intervention.
19. Students will view and respond to suspended ftp push distribution destinations.
20. Students will check/modify OM queue status.
21. Students will check/modify HEG order status.
22. Students will check staging status.
23. Students will check/modify OM configuration parameters.
24. Students will add a destination to the frequently used destinations list.
25. Students will view the OM GUI log.
26. Students will view physical media distribution (PMD) open intervention information on the OM GUI.
27. Students will respond to a PMD open intervention.
28. Students will check and modify PMD device configuration.

29. Students will monitor/control PMD media creation on the OM GUI.

30. Students will prepare an input file for use with the OMS Configuration CI.

31. Students will configure how long order-tracking information is kept in the OMS database.

32. Students will modify system parameters.

Volume 10: Archive - Retired

Volume 11: Database Administration

Volume 11 provides a functional overview of the system databases and detailed descriptions of the tasks required to maintain the database system including the operations interface to perform database administration, product installation and disk storage management, backup and recovery, managing SQL server login accounts and privileges, database tuning and performance monitoring, database security and auditing, database integrity monitoring, and database troubleshooting.

Attendees: DAAC Database Administrator, DAAC Science Data Specialist, DAAC System Engineer, DAAC System Test Engineer, DAAC SW Maintenance Engineer, DAAC User Services Representative and Sustaining Engineering personnel.

Prerequisites: None

Duration: 7 Hours (2 Lecture, 2 Lab)

Sub-tasks:

1. System overview.
    a. General design.
    b. Database management.
2. Database Administrator (DBA) responsibilities.
3. Starting and stopping servers.
4. Creating database devices and logical volumes.
    a. Database devices.
    b. Logical volumes.
5. Installing Databases and Patches
    a. Custom databases.
    b. COTS databases.

6. Configuring databases.
    a. Configuration parameters.
    b. Configuration parameters and the Configuration Registry.
7. Working with indexes, segments, and caches.
    a. Indexes.
    b. Segments.
    c. Caches.
8. Backing up and recovering data.
    a. Backups.
    b. Database recovery.
9. Establishing database security.
    a. Discretionary access controls.
    b. Identification and authentication controls.
    c. Auditing.
    d. EMD Security Directive.
10. Copying, replicating, and extracting data.
    a. Copying databases.
    b. Individual databases.
    c. Bulk copying.
11. Replication system administration.
    a. Replication system administrator tasks.
    b. DAAC DBA replication roles and tasks.
    c. Database replication.
12. Performance monitoring, tuning, and problem reporting.
    a. Database monitoring.
    b. Database tuning.
13. Ensuring database quality.
14. Sybase troubleshooting.
    a. Space usage.
    b. Deadlocks.

15. Oracle procedures.
    a. Oracle operating system environment.
    b. Starting up the database.
    c. Shutting down the database.
    d. Controlling the listener.
    e. Data Dictionary view categories,
    f. Obtaining information and controlling the system.
    g. Oracle troubleshooting.
    h. Accessing dynamic performance view.
    i. Displaying parameter values.
    j. Displaying information about users.
    k. Displaying information about system privileges and object privileges.
    l. Terminating sessions.

Practical Exercises. The student will perform the following hands-on training exercises:

1. Students will start and stop Sybase Adaptive Server Enterprise (ASE) servers.
2. Students will create new database devices.
3. Students will configure databases using the Configuration Registry GUI.
4. Students will monitor database performance using sp_sysmon.
5. Students will perform a database backup.
6. Students will perform database recovery.
7. Students will troubleshoot chronic deadlocks on a database host.

Volume 12: Configuration Management - Retired

Volume 13: User Services - Retired

Volume 14: Not Used

Volume 15: Not Used

Volume 16: Science Software Integration & Test - Retired

Volume 17: System Troubleshooting - Retired

Volume 18: Advanced Production Planning and Processing – Retired

This page intentionally left blank.

Training Schedule

Course Duration

Table 1 provides a summary of the course duration. This summary is tied to the duration of each lesson and reflects the lecture-to-lab ratio for each lesson.

Table 1. Course Duration Summary

LESSON	DURATION (Hrs)	LECTURE/LAB (Hrs)
Problem Management	2	1/1
Ingest	8	4/4
Data Distribution	8	4/4
Database Administration	4	2/2
TOTAL	22	11/11

This page intentionally left blank.

Abbreviations and Acronyms

Additional abbreviations and acronyms are listed in document 508-EMD-001, ACRONYMS for the EOSDIS Maintenance and Development (EMD) Project.

API	Applications Program Interface
CBT	Computer Based Training
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CM	Configuration Management
COTS	Commercial Off-the-Shelf
CR	Classroom presentation equipment
CSCI	Computer Software Configuration Item
DAAC	Distributed Active Archive Center
DBA	Database Administration
DCN	Document Change Notice
DID	Data Item Description
DPREP	Data Preprocessing
DPS	Data Processing Subsystem
DSS	Data Server Subsystem
ECS	EOSDIS Core System
EMD	EOSDIS Maintenance and Development [Project]
EMSn	EOS Mission Support Network
EOC	EOS Operations Center
EOSDIS	Earth Observing System Data Information System
ESDT	Earth Science Data Type
GeoTIFF	Georeferenced Tagged Image File Format
GUI	Graphical User Interface
HDF	Hierarchical Data Format

HEG	HDF-EOS to GeoTIFF Conversion Tool
HW	Hardware
I&T	Integration and Test
ILM	Inventory/Logistical Management
ILS	Integrated Logistics Support
IV&V	Independent Verification and Validation
LSM	Local System Management
MSS	System Management Subsystem
NASA	National Aeronautics and Space Administration
NBSRV	Spatial Subscription Server
OGC	Open Geospatial Consortium
OWS	Open Geospatial Consortium (OGC) Web Services
PDPS	Planning and Data Processing Subsystems (especially with reference to the Planning and Data Processing Subsystems' shared database)
PDS	Product Distribution System
PGE	Product Generation Executive
PGE	Principal Investigator
PMD	Physical Media Distribution
QA	Quality Assurance
S/C	Spacecraft
SCF	Science Computing Facility
SDP	Science Data Processing
SE	Sustaining Engineering
SMC	Systems Monitoring Center
SME	Subject-Matter Expert
SSI&T	Science Software Integration and Test
SW	Software
T^3	Train-the-Trainer